

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P005179-PCT	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/BR2004/000002	International filing date (day/month/year) 08.01.2004	Priority date (day/month/year) 08.01.2003
International Patent Classification (IPC) or national classification and IPC F04B35/04		
Applicant EMPRESA BRASILEIRA de COMPRESSORES EMBRACO et al.		
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> sent to the applicant and to the International Bureau a total of sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (Indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>		
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input checked="" type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>		
Date of submission of the demand 27.10.2004	Date of completion of this report 15.12.2004	
Name and mailing address of the International preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Pinna, S Telephone No. +49 89 2399-7912	



INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITYInternational application No.
PCT/BR2004/000002**Box No. I Basis of the report**

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:

- ☐ international search (under Rules 12.3 and 23.1(b))
- ☐ publication of the international application (under Rule 12.4)
- ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages

1-18 as originally filed

Claims, Numbers

1-21 as originally filed

Drawings, Sheets

1/7-7/7 as originally filed

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing *(specify)*:
- ☐ any table(s) related to sequence listing *(specify)*:

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing *(specify)*:
- ☐ any table(s) related to sequence listing *(specify)*:

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**International application No.
PCT/BR2004/000002**Box No. II Priority**

1. ☒ This report has been established as if no priority had been claimed due to the failure to furnish within the prescribed time limit the requested:
- ☒ copy of the earlier application whose priority has been claimed (Rule 66.7(a)).
 - ☐ translation of the earlier application whose priority has been claimed (Rule 66.7(b)).
2. ☐ This report has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rule 64.1). Thus for the purposes of this report, the international filing date indicated above is considered to be the relevant date.
3. Additional observations, if necessary:

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-21
	No: Claims	
Inventive step (IS)	Yes: Claims	1-21
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-21
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

**INTERNATIONAL PRELIMINARY
REPORT ON PATENTABILITY
(SEPARATE SHEET)**

International application No.

PCT/BR2004/000002

Re Item V

Reference is made to the following documents:

D1: US 2002/093327 A1 (HWANG MIN KYU ET AL) 18 July 2002 (2002-07-18)

D2: US-A-5 980 211 (NAKAYAMA TAKAFUMI ET AL) 9 November 1999 (1999-11-09)

1. The document D1 is regarded as being the closest prior art to the subject-matter of claim 1, and discloses (the references in parentheses applying to this document):

a system 200, 300, 400, 500 600 for controlling a linear compressor 100, the linear compressor comprising:

- a movable assembly;
- a motor fed by an application voltage, an electronic switching device; and
- an electronic circuit 600 controlling the electronic switching device to control the application voltage applied to the motor, and the motor driving the movable assembly;

whereby:

- the electronic circuit 200, 300, 400 measures an actuation phase of the current circulating in the motor and a dynamic phase of the movable assembly and establishes a relationship between the actuation phase and the dynamic phase, determining a measured phase.

The subject-matter of claim 1 differs from this known system in that

- the electronic circuit obtains a value of a correction voltage from the value of the measured phase.
- the electronic circuit obtains a value of a defined voltage from a physical position of the movable assembly,
- the electronic circuit actuates on the value of the application voltage from the sum of the correction voltage and the defined voltage.

**INTERNATIONAL PRELIMINARY
REPORT ON PATENTABILITY
(SEPARATE SHEET)**

International application No.

PCT/BR2004/000002

The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

The problem to be solved by the present invention may be regarded as to provide a system for controlling the movement of a piston in a linear compressor which prevent the piston from colliding against the valve plate and granting at the same time good compressing performances.

The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) since none of the prior art documents D1-D2 discloses the distinguishing features of claim 1, which allow the voltage to be applied to the motor to be constantly corrected in function of various operating characteristics of the compressor.

2. For analogous reasons as here above, the subject-matter of independent claims 13 and 18 is also considered to be new and inventive.
3. Claims 2-12, 14-17, 19-21 are dependent respectively on claims 1, 13 and 18 and as such also meet the requirements of the PCT with respect to novelty and inventive step.
4. Further, the application presents the following deficiencies:
 - a) Although claims 1, 13 and 18 are drafted in the two-part form some of their features are incorrectly placed in the characterising portion, as they are disclosed in document D1 in combination with the features placed in the preamble (Rule 6.3(b) PCT).
 - b) Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D1 is not mentioned in the description, nor is this document identified therein.
 - c) The vague and imprecise statement in the description on page 18 line 12 implies that the subject-matter for which protection is sought may be different to that defined by the claims, thereby resulting in lack of clarity (Article 6 PCT) when used to interpret them (see also the PCT Guidelines, III-4.3a).